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of their environment. In short, it is a study of the ecological anatomy of fossil leaves. The leaves of *Calamites* are mostly known as impressions, and THOMAS has referred the structures he has been able to obtain to the better known impression forms. The petrified material used was obtained from the Lower Coal-measures (Halifax Hard Bed), and five types of leaf were distinguished. The twigs bearing the leaves proved to be quite interesting in stellar structure, especially in its relation to that of young stems of *Equisetum*.

The ecological conclusion is as follows: "The leafy twigs seem to have grown in a pendulous fashion, and the structure of the mesophyll and epidermis suggests that the habitat was a damp one. On the other hand, the leaves possess some xeromorphic features, such as the presence of fibers in the longer forms. The evidence points to a marsh or swamp forest as their habitat; this may have been near the sea, but if so the soil probably contained little salt."—J. M. C.

Transpiration in salt marsh plants.—Transpiration rates of cut shoots of *Salicornia annua* and *Suaeda maritima* have been found by DELF⁴³ to be equal to or greater than those from equal surface areas of such mesophytes as *Vicia Faba*. The highest degree of succulence seemed to be accompanied by the highest transpiration rate per unit area. Relating transpiration to evaporation from a water surface, unit areas of *Salicornia* lost 32 per cent and of *Vicia* 26 per cent as much water as equal areas of water surface. It was shown that *Salicornia* is able to absorb water readily through the surface of its stems when submerged, and less convincingly that it does not absorb sufficiently through its root system to replace the loss by transpiration except in a humid atmosphere. This seems the more surprising, since TRANSEAU⁴⁴ has shown evaporation to be exceptionally high in salt marshes. The stomata in *Salicornia* and *Aster trifolium* appear to have distinct powers of movement in young plants early in the season, losing this plasticity at a later date.—GEO. D. FULLER.

Cytology of the ascus.—An account of the cytology of *Helvella crispa* Fries is given by Miss CARRUTHERS.⁴⁵ The cells of the hypothecium are one to several-nucleate, and some of the nuclei were observed to fuse in pairs, but no migration was observed like that in *Humaria*. An attempt was made to determine the number of chromosomes on the spindles in the vegetative hyphae. Apparently two chromosomes are present in the vegetative spindles, and four or eight on the spindles in the fertile hyphae, but owing to the minuteness of the objects not much importance can be attached to these observations. The

⁴³ DELF, E. MARION, Transpiration and behavior of stomata in halophytes. *Ann. Botany* **25**:484-505. 1911.

⁴⁴ BOT. GAZ. **45**:217-231. 1908.

⁴⁵ CARRUTHERS, D., Contributions to the cytology of *Helvella crispa* Fries. *Ann. Botany* **25**:243-252. *pls. 2.* 1911.